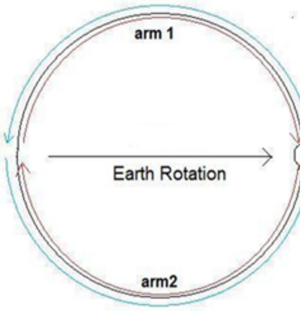
Sagnac Interferometer / Fibre-Optic Gyroscope (FOG):

Sagnac loop Length (m)	1615	Refractive Index of fibre	1.0000	
Loop radius (m)	257.04	wavelength of light	5.700e-007	
number of loops	1.00	tangential v due to earth:		
frame Velocity w (m/s)	346.83	z-axis = vertical	1.245e-2	m/s
Rotational velocity v (m/s)	1.25e-002	z-axis = NS	1.394e-2	m/s
area of loop (m2):	2.0756e+5	z-axis = EW	0	m/s

Angle Wind:	Arm 1 forward Time	Arm 2 return Time	Time round trip:	Time Difference Blue -Red
0	2.691664685723329e-6	2.691668647835768e-6	**5.383333333559096e-6**	4.486107e-16
0	2.691664685499023e-6	2.691668647611462e-6	**5.383333333110486e-6**	Fringe Difference:
	Arm 1 forward Time	Arm 2 return Time	Time round trip:	2.361109e-1
	Arm 1 forward Time	Arm 1 forward Time	Time round trip:	Time Difference Blue-Red
90	2.691668647835768e-6	2.691664685723329e-6	**5.383333333559096e-6**	4.486107e-16
90	2.691664685499023e-6	2.691668647611462e-6	**5.383333333110486e-6**	Fringe Difference
	Arm 1 forward Time	Arm 2 return Time	Time round trip:	2.361109e-1

Earth Rotational Velocity:		**Lorentz Contraction γ :**	0.99999999999973
Latitude (degrees):	min.	0= YES, 1 = No	0
41	46		**ΔFringe due to γ :**
346.83	m/s		**6.395e-14**

................Earth Rotation Values:		**......Regular Rotation/Translation Values:......**	
Using Eq. 1 Method:	Using Eq. 1 Method:	Using Eq. 2 Method:	Using Eq. 2 Method:
ΔFringe due to Earth Rot. :	**Δt due to Earth rot. :**	z-axis = vertical	z-axis = vertical
z-axis = vertical	4ΩAsin(lat)/c2	**ΔFringe due to frame vel. w:**	**Δt due to frame velocity w:**
2.360e-1	**4.485e-16**	**0.000e+0**	**0.000e+0**
z-axis = NS	4ΩAcos(lat)/c2	z-axis = vertical	z-axis = vertical
2.643e-1	**5.0219e-16**	**ΔFringe due to rot. vel. v:**	**Δt due to rot. velocity v:**
z-axis = EW	no Ω in this plane	**2.361e-1**	**4.486e-16**
0.00e+0	**0.00e+000**		



Equation 1 Method:

$$\Delta t = \frac{4A\Omega}{c^2} \qquad \Delta fringe = \frac{4A\Omega}{c\lambda}$$

Equation 2 Method:

addition of velocities

t = (π*r * γ)/(c/n +/-(2/π)(w/n2)+/- v/n2)

Average frame velocity is 2w/π per arm.

note that: Δfringe = 4AΩ/cλ = 4Av/cλr

since Ω = v/r where v = rotational velocity and r